

REMARKS

A. Background

Claims 12, 13, 15, 16, 18, 20-23, 29-32, and 35-39 were pending in the application at the time of the Office Action. Claims 12, 13, 15, 16, 18, 20-23, 30-32 and 36-39 were rejected as being anticipated by and/or obvious over cited art. By this response applicant has added new claims 43-45. As such, claims 12, 13, 15, 16, 18, 20-23, 29-32, 35-39, and 43-45 are presented for the Examiner's consideration in light of the following remarks.

B. Proposed Amendments to the Claims

Applicant has herein added new claims 43-45. The new claims are supported in the application at least by Figure 8 and page 31, line 19 to page 32, line 7 of the specification as originally filed. In view of this, applicant submits that the new claims do not introduce new matter and entry thereof is respectfully requested.

C. Rejection based on 35 USC § 102

Paragraphs 2 and 3 of the Office Action reject claims 12, 13, 15, 18, 21, 23, 30-32, 34, and 36-38 under 35 USC § 102(b) as being anticipated by an article titled "Inherently Mode-Hop-Free Distributed Bragg Reflector (DBR) Laser Array" by Fujiwara et al. ("*Fujiwara*"). Applicant respectfully traverses this rejection and submits that *Fujiwara* does not anticipate claims 12, 13, 15, 18, 21, 23, 30-32, 34, and 36-38 because *Fujiwara* does not include each and every claim limitation recited in the rejected claims.

In Applicant's prior response submitted on April 2, 2008 (the "Prior Response"), Applicant amended claims 12 and 29 to recite "according to an increase or decrease in the DBR control current, a refractive index of said active region optical waveguide equally decreases or

increases, respectively, in accordance with a refractive index of the first DBR region and the second DBR region such that a ratio of the lasing wavelength shift quantity to the Bragg wavelength shift quantity is maintained in a range from 0.9 to 1.1,” and amended claim 35 to recite “wherein according to an increase or decrease in the DBR control current, a refractive index of said active region optical waveguide equally decreases or increases, respectively, in accordance with a refractive index of the DBR region such that a ratio of the lasing wavelength shift quantity to the Bragg wavelength shift quantity is maintained in a range from 0.9 to 1.1”

Applicant presented arguments in the Prior Response as to why *Fujiwara* did not disclose the added limitations to claims 12, 29 and 35 and also why it would not have been obvious to modify the teachings of *Fujiwara* to include the aforementioned limitations. For example, Applicant pointed out that besides the effect the tuning current has on the wavelength, *Fujiwara* fails to disclose any information regarding any currents, including the effect of any current on the refractive index of the active layer, and that because the carrier density is clamped, the carrier density in *Fujiwara* is constant and the refractive index is not changing in the active region.

In the present Office Action, the Examiner has failed to answer the substance of Applicant’s arguments, but has simply stated with regard to the added limitations that *Fujiwara* discloses:

wherein according to an increase or decrease in the DBR control current, a refractive index of said active region optical waveguide equally decreases or increases (see, left section, line 15, p. 1133), respectively, in accordance with a refractive index of the first DBR region and the second DBR region such that a ratio of the lasing wavelength shift quantity is maintained in a range from 0.9 to 1.1 (see, (1) and (2), right section, p. 1132, also, (5), left section, p. 1133).

Office Action at pp. 2-3. In other words, the Office Action has simply recited, *verbatim*, the added limitations and pointed to a single line and three equations of the cited reference to support the assertion that the added limitations are disclosed in *Fujiwara*. In a subsequent telephone

conversation, the Examiner clarified that “line 15, p. 1133” referred to the first line after equation 5 on p. 1133 that begins “where n_{eff} is the effective refractive index...”

Applicant submits that the Office Action has failed to establish anticipation regarding the added limitations. Applicant has reviewed the cited sections of *Fujiwara* and can find no basis for the Office Action’s assertion that the cited sections disclose the limitations discussed above. The cited section of *Fujiwara* (“left section, line 15, p. 1133”), even liberally including the first part of line 16, simply states that “ n_{eff} is the effective refractive index, and $n_{\text{eff-DBR}} = n_{\text{eff-ACT}}$ was assumed.” Contrary to the implication of the Office Action, nowhere in this portion of *Fujiwara*, nor in the cited equations 1, 2, and 5 of *Fujiwara*, is there any disclosure or suggestion that “according to an increase or decrease in the DBR control current, a refractive index of said active region optical waveguide equally decreases or increases, respectively, in accordance with a refractive index of the first DBR region and the second DBR region such that a ratio of the lasing wavelength shift quantity is maintained in a range from 0.9 to 1.1,” as generally recited in claims 12, 29, and 35. As such, the Office Action has failed to establish anticipation of claim 12 because the Office Action has not established that all of the claim limitations are disclosed in *Fujiwara*. And simply citing to various sections of *Fujiwara* has not answered nor countered Applicant’s prior arguments. As such, Applicant submits that Applicant’s arguments set forth in the Prior Response remain valid.

Applicant further submits that the *Fujiwara* reference actually teaches away from the added limitations. For example, although the cited line of *Fujiwara* discloses that the effective refractive index of DBR regions ($n_{\text{eff-DBR}}$) and the effective refractive index of the active region ($n_{\text{eff-ACT}}$) are the same (i.e., “ $n_{\text{eff-DBR}} = n_{\text{eff-ACT}}$ ”), *Fujiwara* clearly states that “[a]s seen from equation (1) and (2), the cavity modes shift slower than Bragg wavelength when $\Delta n_{\text{eq-ACT}}=0$ is

assumed.” (p. 1133, left section, lines 7-8, emphasis added). *Fujiwara* clearly uses this assumption throughout equations (1)-(5). Although $\Delta n_{\text{eq-ACT}}$ is not clearly defined in *Fujiwara*, it appears to represent a change of $n_{\text{eq-ACT}}$, that is, a variation of equivalent refractive index of the active region according to the DBR current. Accordingly, the assumption used in *Fujiwara* that $\Delta n_{\text{eq-ACT}}=0$, apparently denotes that the equivalent refractive index of the active region is NOT changed according to an increase or decrease in the DBR control current in *Fujiwara*. It is commonly known by one of skill in the art that if $n_{\text{eq-ACT}}$ (the equivalent refractive index) is not changed, then $n_{\text{eff-ACT}}$ (the effective refractive index) correspondingly will not be changed. This clearly teaches away from the added limitations to claims 12, 29, and 35, discussed above.

Therefore, because *Fujiwara* fails to disclose and actually teaches away from various limitations of claim claims 12, 29, and 35, Applicant submits that *Fujiwara* does not anticipate claims 12, 29, and 35 and requests that the anticipation rejection with respect to claim 12 be withdrawn.

Claims 13, 15, 18, 21, 23, 30-32, 34, and 36-38 each depend from one of claims 12, 29, and 35 and thus incorporate the limitations thereof. As such, applicant submits that claims 13, 15, 18, 21, 23, 30-32, 34, and 36-38 are distinguished over the cited art for at least the same reasons as discussed above with regard to claims 12, 29, and 35. Accordingly, Applicant respectfully requests that the anticipation rejection with respect to claims 13, 15, 18, 21, 23, 30-32, 34, and 36-38 also be withdrawn.

D. Rejection based on 35 USC § 103

Paragraphs 4 and 5 of the Office Action reject claims 16 and 20 under 35 USC § 103(a) as being obvious over *Fujiwara* in view of U.S. Patent No. 4,905,253 to Chraplyvy et al.

(“*Chraplyvy*”). *Chraplyvy* was merely cited for allegedly teaching “an anti-reflection coatings to two end faces.” Paragraph 6 of the Office Action rejects claims 22 and 39 under 35 USC § 103(a) as being obvious over *Fujiwara* in view of U.S. Patent No. 4,993,036 to Ikeda et al. (“*Ikeda*”). *Ikeda* was merely cited for allegedly teaching a “diffraction grating with different grating.” Applicant submits that the Office Action has not established that the allegedly obvious combinations would include each and every element recited in the rejected claims.

Claims 16, 20, 22, and 39 each depend from one of claims 12 and 35 and thus incorporate the limitations thereof. As such, even if, *arguendo*, it would have been obvious to combine *Fujiwara* with the cited references in the allegedly obvious manners set forth in the Office Action, the resulting combinations would still not cure the deficiencies of *Fujiwara* with regard to claims 12 and 35. As such, Applicant submits that claims 16, 20, 22, and 39 are distinguished over the cited art for at least the same reasons as discussed above with regard to claims 12 and 35. Accordingly, Applicant respectfully requests that the obviousness rejections with regard to claims 16, 20, 22, and 39 be withdrawn.

No other objections or rejections were set forth in the Office Action.

E. Claims 29 and 35

The Examiner has not explicitly rejected or allowed claims 29 or 35 in the Office Action. Instead, the Examiner discusses those claims on pages 6-7 of the Office Action and appears to imply that those claims would be rejected based on obviousness. Nevertheless, Applicant submits that claims 29 and 35 are differentiated over the cited references for the same reasons discussed above regarding claim 12.

F. New Claims

Applicant submits that new claims 43-45 are also distinguished over the cited art of record. For example, claims 43-45 each recite “the decrease or the increase in said refractive index of said active region optical waveguide is respectively caused by an increase or a decrease in a threshold current of the active region optical waveguide.” Applicant submits that none of the cited art, individually or combined, teach or suggest these limitations.

Furthermore, new claims 43-45 respectively depend from independent claims 12, 29, and 35 and thus incorporate the limitations thereof. As such, claims 43-45 are distinguished over the cited art for at least the reasons given above regarding claims 12, 29, and 35.

G. Conclusion

Applicant notes that this response does not discuss every reason why the claims of the present application are distinguished over the cited art. Most notably, applicant submits that many if not all of the dependent claims are independently distinguishable over the cited art. Applicant has merely submitted those arguments which it considers sufficient to clearly distinguish the claims over the cited art.

In view of the foregoing, applicant respectfully requests the Examiner’s reconsideration and allowance of claims 12, 13, 15, 16, 18, 20-23, 29-32, 35-39, and 43-45 as amended and presented herein.

The Commissioner is hereby authorized to charge payment of any of the following fees that may be applicable to this communication, or credit any overpayment, to Deposit Account No. 23-3178: (1) any filing fees required under 37 CFR § 1.16; (2) any patent application and reexamination processing fees under 37 CFR § 1.17; and/or (3) any post issuance fees under 37

CFR § 1.20. In addition, if any additional extension of time is required, which has not otherwise been requested, please consider this a petition therefor and charge any additional fees that may be required to Deposit Account No. 23-3178.

In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Dated this 14th day of October 2008.

Respectfully submitted,

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